

Instant Gigabit® Series

Gigabit 8-Port Workgroup Switch



Use this Guide to install:

EG005W Gigabit 8-Port Workgroup Switch

User Guide

LINKSYS®

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Linksys guarantees that every Gigabit 8-Port Workgroup Switch is free from physical defects in material and workmanship under normal use for TWO years from the date of purchase. If the product proves defective during this warranty period, call Linksys Technical Support in order to obtain a Return Authorization number. BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. When returning a product, mark the Return Authorization Number clearly on the outside of the package and include a copy of your original proof of purchase. All customers located outside of the United States of America and Canada shall be held responsible for shipping and handling charges.

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Linksys P.O. Box 18558, Irvine, CA 92623.

FCC STATEMENT

The Gigabit 8-Port Workgroup Switch has been tested and complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or device
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

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Chapter 1: Introduction

The Gigabit 8-Port Workgroup Switch

The Gigabit 8-Port Workgroup Switch provides non-blocking, wire speed switching for your 10, 100, and 1000 megabit network clients. Drop this switch in place of your current workgroup hub or switch, and you can upgrade your high-requirement workstations to full Gigabit speeds as necessary, while continuing to service other clients at their current speeds. Or build your network from the ground up, with appropriate link speeds for each user's requirements.

Apply this switching power to your current hub-based Ethernet network, and your data traffic efficiency will improve several times over. Connect your Gigabit-equipped workstations to the Switch's 10/100/1000 ports for full-duplex, dedicated bandwidth of up to 2000Mbps! It's perfect for graphics, multimedia, and other applications that have to move large files across the network quickly.

With the Gigabit 8-Port Workgroup Switch, you can connect your existing 10/100 Ethernet network to your Gigabit server backbone without any additional equipment. All ports are auto-negotiating, and have automatic MDI/MDI-X crossover detection, so you don't have to worry about the cable type. Address learning and aging is supported, as well as 802.3x flow control with head-of-line blocking prevention to keep your high-speed clients from bogging down in lower-speed traffic.

The Gigabit 8-Port Workgroup Switch from Linksys is the perfect solution for your desktop Gigabit and 10/100 networking needs.

Features

- 8 RJ-45 10/100/1000Mbps auto-sensing half/full duplex switched ports
- All ports support auto MDI/MDI-X cable detection
- Fully compliant with IEEE 802.3, 802.3u, 802.3x, 802.3ab
- Non head-of-line blocking architecture
- Full-duplex IEEE 802.3x flow control and half-duplex backpressure with intelligent port-based congestion detection and broadcast rate control

Chapter 2: Getting to Know the Gigabit 8-Port Workgroup Switch

The Gigabit 8-Port Workgroup Switch's Back Panel

Connections for power and to your network are made through the ports on the Switch's Back Panel, shown in Figure 2-1.



Figure 2-1

Network Ports These LAN (Local Area Network) ports connect network devices, such as PCs, print servers, and network attached storage at 10/100/1000Mbps. Or, they can be used to expand your network by connecting to a 1000Mbps hub or switch. When connecting to a PC equipped with an Instant Gigabit Network Adapter, just plug one end of a Category 5e Ethernet network cable into the RJ-45 port on the Adapter and the other end into one of the ports on the Gigabit Switch.

Power The Power port is where you will connect the included power cord.

The Gigabit 8-Port Workgroup Switch's Front Panel

activity.

Power *Green.* The Power LED lights up when the Switch is powered on.

Link/Act *Green.* The Link/Act LED blinks when data is being sent or received through the port. When the LED is off, there is no data being transferred through the port.



Figure 2-2

Speed *Green.* The Speed LED blinks when that port is transmitting at 1000 mbps. If the LED is not lit, the port is transmitting at 10 or 100 mbps.

FDX *Amber.* If the FDX (Full Duplex/Collision) LED is lit up continuously, the connection made through the corresponding port is running in Full Duplex mode. If the LED is blinking, the port is experiencing data collisions. Infrequent collisions are normal. If this LED is blinking often, there may be a problem with your connection.

Chapter 3: Installing the Gigabit 8-Port Workgroup Switch

Overview

Installing the EtherFast® Gigabit Ethernet Switch may involve installing both an adapter and the Gigabit Ethernet Switch. If you are integrating these items into an existing network, some additional steps may be necessary involving settings for your existing equipment. Consult your network administrator for more information about how the Gigabit Ethernet Switch will interface with your existing network components.

Installing the Gigabit 8-Port Workgroup Switch

The Switch's back panel has eight RJ-45 ports. Each 10/100/1000 port automatically detects the speed and duplex of the attached cabling to a network card, switch, hub, etc. The ports operate in either 1000Mbps, 100Mbps, or 10Mbps.

Each 10/100/1000 port on your Switch can connect to workstations, file servers, hubs, routers or other switches. Connections to the switch require Category 5 Ethernet network cabling (Category 5e for Gigabit connections).

To connect a computer directly to the Switch, plug one end of a standard network cable into the switch, and then plug the other end of the cable into the computer's network adapter.

Connecting Your Hardware Together and Booting Up

Plug in the Gigabit Ethernet Switch's power cable. The Power LED will light up. As devices make connections to the Switch's ports, each port's corresponding FDX or ACT LED will light up. The remaining LEDs will also light up according to how your connection is made, e.g. full or half duplex, 10Mbps, 100Mbps, or 1000Mbps.

If the Switch experiences excessive data collisions, verify that your network cabling is securely crimped and installed properly.

Tips on Switching Your Network

Here are some of the ways the new Switch can help you optimize your network speed.

- Speed up Nodes from Your 10BaseT Network

In a 10BaseT network, connect your hubs, file servers, and key users, such as network administrators, directly to your Switch to channel dedicated bandwidth in full-duplex mode (if operating in full-duplex) to each station. The Switch will have dedicated communication with all its connections simultaneously, whereas a hub will only communicate in half-duplex transfer mode and broadcasts information to all ports.

- Conserving Bandwidth with 10Mbps, 100Mbps and 1000Mbps Segments

10BaseT and 100BaseTX hardware are not readily compatible, but the Switch can designate network segments of different speeds. This allows you to run one 100Mbps segment to serve users without a need for considerable speed, and a faster 1000Mbps segment devoted to users who depend heavily on graphics, multimedia, database, or other speed-intensive applications. With switched segmentation, your 1000Mbps users will not be slowed down by the users on the 10/100Mbps segment.

- Run 10/100Mbps Peripherals in a 1000Mbps Network

Most of the network peripherals in place today run at 10/100Mbps, since 100BaseTX has been the standard network speed to date. These peripherals, designed to operate at 100Mbps, cannot readily communicate with 1000BaseTX equipment. A 10Mbps interface is also required for cable and DSL connections, which are quickly becoming very popular ways to access the Internet. The Switch provides your 10BaseT equipment and cable and DSL lines with a 10Mbps interface while still running your Fast Ethernet devices at 100Mbps or your Gigabit devices at 1000Mbps.

- Strengthen Data Transfers through Signal Regeneration

The Switch functions as a repeater, which regenerates data signals as they pass through it. This feature acts as a safeguard to deter data loss and ensure that transmissions arrive at their destination intact. Switches positioned between hubs can preserve your data's integrity and eliminate your need to buy and use repeaters in your Fast Ethernet or Gigabit network.

Appendix A: Glossary

10BaseT - An Ethernet standard that uses twisted wire pairs.

100BaseTX - IEEE physical layer specification for 100 Mbps over two pairs of Category 5 UTP or STP wire.

1000BASE-T - provides half-duplex and full-duplex 1000Mb/s Ethernet service over Category 5 links as defined by ANSI/TIA/EIA-568-A. Topology rules for 1000BASE-T are the same as those used for 100BASE-T. Category 5 link lengths are limited to 100 meters by the ANSI/TIA/EIA-568-A cabling standard.

Adapter - Printed circuit board that plugs into a PC to add to capabilities or connectivity to a PC. In a networked environment, a network interface card is the typical adapter that allows the PC or server to connect to the intranet and/or Internet.

Architecture - The total design and implementation of the network. It includes the network's topology, transmission technologies and communications protocols, management and security systems, and any other attributes that give a network a particular set of capabilities and functionalities.

Auto-MDI/MDIX - On a network hub or switch, an auto-MDI/MDIX port automatically senses if it needs to act as a MDI or MDIX port. The auto-MDI/MDIX capability eliminates the need for crossover cables.

Auto-negotiate - To automatically determine the correct settings. The term is often used with communications and networking. For example, Ethernet 10/100 cards, hubs and switches can determine the highest speed of the node they are connected to and adjust their transmission rate accordingly.

Backbone - The part of a network that connects most of the systems and networks together and handles the most data.

Bandwidth - The transmission capacity of a given facility, in terms of how much data the facility can transmit in a fixed amount of time; expressed in bits per second (bps).

Bit - A binary digit. The value - 0 or 1-used in the binary numbering system. Also, the smallest form of data.

Boot - To cause the computer to start executing instructions. Personal computers contain built-in instructions in a ROM chip that are automatically executed on startup. These instructions search for the operating system, load it and pass control to it.

CAT 5 - ANSI/EIA (American National Standards Institute/Electronic Industries Association) Standard 568 is one of several standards that specify "categories" (the singular is commonly referred to as "CAT") of twisted pair cabling systems (wires, junctions, and connectors) in terms of the data rates that they can sustain. CAT 5 cable has a maximum throughput of 100 Mbps and is usually utilized for 100BaseTX networks.

CAT 5e - The additional cabling performance parameters of return loss and far-end crosstalk (FEXT) specified for 1000BASE-T and not specified for 10BASE-T and 100BASE-TX are related to differences in the signaling implementation. 10BASE-T and 100BASE-TX signaling is unidirectional-signals are transmitted in one direction on a single wire pair. In contrast, Gigabit Ethernet is bi-directional-signals are transmitted simultaneously in both directions on the same wire pair; that is, both the transmit and receive pair occupy the same wire pair.

Database - A database is a collection of data that is organized so that its contents can easily be accessed, managed, and updated.

Data Packet - One frame in a packet-switched message. Most data communications is based on dividing the transmitted message into packets. For example, an Ethernet packet can be from 64 to 1518 bytes in length.

DSL (Digital Subscriber Line) - A technology that dramatically increases the digital capacity of ordinary telephone lines into the home or office and, by employing unused bandwidth, still allows for normal phone usage. DSL provides "always-on" operation, eliminating the need to dial in to the service.

Ethernet - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium. Has a transfer rate of 10 Mbps. Forms the underlying transport vehicle used by several upper-level protocols, including TCP/IP and XNS.

Fast Ethernet - A 100 Mbps technology based on the 10Base-T Ethernet CSMA/CD network access method.

Full Duplex - The ability of a device or line to transmit data simultaneously in both directions.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

Hardware - Hardware is the physical aspect of computers, telecommunications, and other information technology devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program you put in it to make it do things. The program came to be known as the software.

Hub - The device that serves as the central location for attaching wires from workstations. Can be passive, where there is no amplification of the signals; or active, where the hubs are used like repeaters to provide an extension of the cable that connects to a workstation.

IEEE (The Institute of Electrical and Electronics Engineers) - The IEEE describes itself as "the world's largest technical professional society, promoting the development and application of electrotechnology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of our members."

The IEEE fosters the development of standards that often become national and international standards. The organization publishes a number of journals, has many local chapters, and several large societies in special areas, such as the IEEE Computer Society.

LAN (Local Area Network) - A group of computers and associated devices that share a common communications line and typically share the resources of a single processor or server within a small geographic area (for example, within an office building).

Mbps (Megabits per second) - One million bits per second; unit of measurement for data transmission.

MDI (Medium Dependent Interface) - On a network hub or switch, a MDI port, also known as an uplink port, connects to another hub or switch using a straight-through cable. To connect a MDI port to a computer, use a crossover cable.

MDIX (Medium Dependent Interface Crossed) - On a network hub or switch, a MDIX port connects to a computer using a straight-through cable. To connect a MDIX port to another hub or switch, use a crossover cable.

Network - A system that transmits any combination of voice, video and/or data between users.

Node - A network junction or connection point, typically a computer or work station.

Packet - A unit of data routed between an origin and a destination in a network.

Port - A pathway into and out of the computer or a network device such as a switch or router. For example, the serial and parallel ports on a personal computer are external sockets for plugging in communications lines, modems and printers.

RJ-45 (Registered Jack-45) - A connector similar to a telephone connector that holds up to eight wires, used for connecting Ethernet devices.

Router - Protocol-dependent device that connects subnetworks together. Routers are useful in breaking down a very large network into smaller subnetworks; they introduce longer delays and typically have much lower throughput rates than bridges.

Server - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

Software - Instructions for the computer. A series of instructions that performs a particular task is called a "program." The two major categories of software are "system software" and "application software." System software is made up of control programs such as the operating system and database management system (DBMS). Application software is any program that processes data for the user.

A common misconception is that software is data. It is not. Software tells the hardware how to process the data.

Storage - The semi-permanent or permanent holding place for digital data.

STP - 1. (Shielded Twisted Pair) Telephone wire that is wrapped in a metal sheath to eliminate external interference. 2. (Spanning Tree Protocol) A technology that checks your network for any loops. A loop can often occur in complicated or back-up linked network systems. Spanning-tree detects and directs data along the shortest path, maximizing the performance and efficiency of the network.

Switch - 1. A data switch connects computing devices to host computers, allowing a large number of devices to share a limited number of ports. 2. A device for making, breaking, or changing the connections in an electrical circuit.

TCP (Transmission Control Protocol) - A method (protocol) used along with the IP (Internet Protocol) to send data in the form of message units (datagram) between network devices. While IP takes care of handling the actual delivery of the data (routing), TCP takes care of keeping track of the individual units of data (called packets) that a message is divided into for efficient delivery over the network. TCP is known as a "connection oriented" protocol due to requiring the receiver of a packet to return an acknowledgment of receipt to the sender of the packet resulting in transmission control.

TCP/IP (Transmission Control Protocol/Internet Protocol) - The basic communication language or set of protocols for communications over a network (developed specifically for the Internet). TCP/IP defines a suite or group of protocols and not only TCP and IP.

Throughput - The amount of data moved successfully from one place to another in a given time period.

Topology - A network's topology is a logical characterization of how the devices on the network are connected and the distances between them. The most common network devices include hubs, switches, routers, and gateways. Most large networks contain several levels of interconnection, the most important of which include edge connections, backbone connections, and wide-area connections.

Upgrade - To replace existing software or firmware with a newer version.

UTP - Unshielded twisted pair is the most common kind of copper telephone wiring. Twisted pair is the ordinary copper wire that connects home and many business computers to the telephone company. To reduce crosstalk or electromagnetic induction between pairs of wires, two insulated copper wires are twisted around each other. Each signal on twisted pair requires both wires. Since some telephone sets or desktop locations require multiple connections, twisted pair is sometimes installed in two or more pairs, all within a single cable.

Workgroup - Two or more individuals that share files and databases.

Appendix B: Specifications

Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3x
Ports	8 RJ-45 10/100/1000 Mbps ports
Speed Per Port (Mbps)	10 or 100 or 1000 (Half Duplex) 20 or 200 or 2000 (Full Duplex)
Cabling Type	Category 5e or Better (1000Mbps) Category 5 or Better (10/100Mbps)
LEDs	Power, Link/Act (per port), Speed (per port), FDX (per port)

Environmental

Dimensions	7.32" x 1.89" x 6.06" (186 mm x 48 mm x 154 mm)
Unit Weight	1.1 lbs. (0.5 kg)
Power	External Power Supply 12V DC, 2A. Input 110 V AC Consumption 18W
Certifications	FCC Part 15 Class A
Operating Temp.	-1°C to 50°C (32°F to 122°F)
Storage Temp.	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	20% to 95%, Non-Condensing
Storage Humidity	20% to 95%, Non-Condensing

Appendix C: Warranty Information

BE SURE TO HAVE YOUR PROOF OF PURCHASE AND A BARCODE FROM THE PRODUCT'S PACKAGING ON HAND WHEN CALLING. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE.

IN NO EVENT SHALL LINKSYS' LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, ITS ACCOMPANYING SOFTWARE, OR ITS DOCUMENTATION. LINKSYS DOES NOT OFFER REFUNDS FOR ANY PRODUCT.

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Appendix D: Contact Information

For help with the installation or operation of the Switch, contact Linksys Technical Support at one of the phone numbers or Internet addresses below.

Sales Information	800-546-5797 (LINKSYS)
Technical Support	800-326-7114
RMA Issues	949-271-5461
Fax	949-265-6655
Email	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com



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